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| EXAMINER | |
|---|---|
| LEUNG, CHRISTINA Y | |
| **ART UNIT** | **PAPER NUMBER** |
| 2633 | |

DATE MAILED: 03/09/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

| Office Action Summary | Application No. | Applicant(s) |
|---|---|---|
| | 09/929,339 | ALTHOUSE ET AL. |
| | Examiner | Art Unit |
| | Christina Y. Leung | 2633 |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☒ Responsive to communication(s) filed on *15 August 2001*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) *1-36* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-27 and 30-36* is/are rejected.

7)☒ Claim(s) *7,28-30 and 34* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *11-20-01, 08-22-02*.

4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

5) ☐ Notice of Informal Patent Application (PTO-152)

6) ☐ Other: _____.

## DETAILED ACTION

### *Claim Objections*

1. Claims 7, 30, and 34 are objected to because of the following informalities:

Claim 7 recites the word "beak" in line 3 of the claim. Examiner respectfully suggests that Applicants amend the word to "break."

Claim 30 recites "during said filtering at least a portion of *said optical filter*" in the last two lines of the claim. Based on Applicants' specification and parent claim 24, Examiner respectfully suggests that Applicants amend the phrase "said optical filter" in the claim to "said optical *signal*."

Claim 34 recites "first a second reference signals" in line 5 of the claim. Examiner respectfully suggests that Applicants amend the phrase to "first *and* second reference signals."

Appropriate correction is required.

### *Claim Rejections - 35 USC § 102*

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

3. Claims 1-7, 9, 11, 14, 15, 18-20, 23-27, 31, 32, and 34-36 are rejected under 35 U.S.C. 102(e) as being anticipated by Alavie et al. (US 6,310,703 B1).

Regarding claim 1, Alavie et al. disclose an optical channel monitor (Figure 9), comprising:

an optical input port (i.e., one of the inputs on the left side of figure 9);

a photodetector (such as photodetector 24) disposed in an optical path communicating at least intermittently with the optical input port (column 6, lines 1-3);

an optical filter (tunable filter 14) disposed in the optical path between the optical input port and the photodetector (column 4, lines 31-35); and

an optical band splitter (wavelength dependent optical splitter 52) disposed in the optical path between the optical filter and the photodetector (column 5, lines 60-64).

Regarding claims 2 and 3, Alavie et al. disclose that the optical filter 14 is a multibandpass filter that is a scanning Fabry-Perot filter (column 4, lines 31-35).

Regarding claim 4, Alavie et al. disclose a second photodetector (photodetector 26 in Figure 9) in optical communication with the optical band splitter 52, wherein the optical band splitter directs light received in one wavelength band to the first mentioned photodetector and directs light received in a second wavelength band to the second photodetector (column 5, lines 60-64).

Regarding claim 5, Alavie et al. disclose an optical switch 12 disposed in the optical path between the optical filter 14 and the optical input port.

Regarding claim 6, Alavie et al. disclose an optical reference system (including light emitting diode 36) in optical communication with the optical switch (column 5, lines 9-15).

Regarding claim 7, Alavie et al. disclose that the optical switch is constructed and arranged to selectively break and close the optical path between the optical input port and

the optical filter, and to break and close a reference optical path between the optical reference system and the optical filter (column 5, lines 7-15).

Regarding claim 9, Alavie et al. disclose the optical reference system comprises a broadband optical source and a plurality of fiber Bragg gratings arranged in series (Figures 3-5, 7, 9, and 10 show various embodiments of the optical reference system including a some explicitly including plurality of fiber Bragg gratings 40 in series). Alavie et al. also disclose that the LED 36 is a broadband source (column 6, lines 7-11)).

Regarding claim 11, Alavie et al. disclose a Fabry-Perot drive source (Figure 1 shows how control and processing electronics 32 drives the channel selector 14, wherein the channel selector is the previously discussed Fabry-Perot filter; column 4, lines 10-13 and lines 31-43).

Regarding claim 14, Alavie et al. disclose another embodiment of the optical channel monitor in Figure including all the limitations recited in claim 1 (input port, photodetector 24, optical filter 14, and an optical band splitter 68) and further disclose a second optical band splitter (multiplexer 60 in Figure 10) disposed in the optical path between the optical input port and the optical filter (column 6, lines 12-22).

Regarding claim 15, Alavie et al. disclose an optical reference system (including LED 62) in optical communication with the first mentioned optical band splitter between the photodetector and the optical filter.

Regarding claim 18, Alavie et al. disclose a second photodetector 26 in optical communication with the second optical band splitter.

Regarding claim 19, Alavie et al. disclose that the optical filter is a scanning Fabry-Perot filter (column 4, lines 31-35).

Regarding claim 20, Alavie et al. disclose a Fabry-Perot drive source (Figure 1 shows how control and processing electronics 32 drives the channel selector 14, wherein the channel selector is the previously discussed Fabry-Perot filter; column 4, lines 10-13 and lines 31-43).

Regarding claim 23, Alavie et al. disclose that the band splitters direct light to separate photodetectors depending on a wavelength of light incident thereon (column 6, lines 12-30).

Regarding claim 24, Alavie et al. disclose a method of measuring characteristics of an optical signal (Figure 10), comprising:

filtering a reference beam of light (from LED 62) with a tunable multibandpass filter 14;

redirecting portions of the filtered reference beam of light to a first photodetector 24 to produce a reference signal;

filtering at least a portion of an optical signal (input light signal shown as signal 13 in Figure 10) with the tunable multibandpass filter 14;

redirecting portions of the filtered portion of the optical signal to a second photodetector 26 to produce a measurement signal; and

determining characteristics of the measurement signal based on a comparison with the reference signal (column 6, lines 20-30).

Alavie et al. disclose that in the method shown in Figure 10, the input signal and reference signals comprise wavelengths in different bands and therefore are received separately at the first and second photodetectors (column 6, lines 12-30).

Regarding claims 25 and 26, Alavie et al. disclose that the filtering a reference beam of light and at least a portion of an optical signal comprises scanning the tunable multibandpass filter over a wavelength range (column 4, lines 31-50; column 5, lines 6-24; column 6, lines 12-30).

Regarding claim 27, Alavie et al. disclose that the comparing the measurement signal with the reference signal comprises generating a first wavelength-to-voltage function for the reference signal and generating a second wavelength-to-voltage function for the measurement signal, since Alavie et al. disclose determining the wavelengths of the reference and measurement signals based on voltage outputs from the photodetectors.

Regarding claim 31, as similarly discussed above with regard to claim 1, Alavie et al. disclose an optical channel monitor (Figure 9), comprising:

an optical input port (one of the inputs on the left side of Figure 9);

a photodetector 24 disposed in an optical path communicating at least intermittently with the optical input port;

an optical filter (tunable filter 14) disposed in the optical path between the optical input port and the photodetector;

an optical switch 12 disposed in the optical path between the optical filter and the optical input port; and

an optical reference system in optical communication with the optical switch, the optical reference system comprising a broadband optical source (LED 36) and a plurality of fiber Bragg gratings 40 disposed between the broadband source and the optical switch.

Regarding claim 32, Alavie et al. disclose an optical band splitter (wavelength dependent splitter 52; column 5, lines 60-64) disposed in the optical path between the optical filter 14 and the photodetector 24.

Regarding claim 34, Alavie et al. disclose a method of measuring characteristics of an optical signal (Figure 9), comprising:

filtering a reference beam of light (from LED 36) with a tunable multibandpass filter 14;

redirecting portions of the filtered reference beam of light to each of first and second photodetectors 24 and 26 according to wavelengths of the portions of filtered reference light to produce first and second reference signals (using wavelength dependent splitter 52);

filtering at least a portion of an optical signal (i.e., the optical signal input through switch 12) with the tunable multibandpass filter 14;

redirecting portions of the filtered portion of the optical signal to each of the first and second photodetectors 24 and 26 to produce first and second measurement signals; and

determining characteristics of the first and second measurement signals based on comparison of the first and second reference (column 3, lines 7-24 and lines 60-63).

Regarding claim 35, Alavie et al. disclose a method of measuring characteristics of an optical signal (Figure 10), comprising:

filtering at least a portion of an optical signal with an optical filter 14 having a first passband substantially equal in wavelength to a wavelength of the optical signal and a second passband at a wavelength different from the optical signal (Alavie et al. disclose

that the optical signal may be in the 1550 nm wavelength band, for example; column 6, lines 16-17);

detecting the filtered portion of the optical signal to generate a measurement signal (using photodetector 26);

filtering a reference light beam (from LED 62) with the optical filter, the reference light beam having light of a wavelength within the second passband of the optical filter (i.e., the 1300 nm band; column 6, lines 14-16);

detecting the filtered reference light beam after it has passed through the optical filter at the second passband to generate a reference signal (using photodetector 24); and

determining a characteristic of the optical signal based on a comparison of the measurement signal to the reference signal (column 6, lines 23-30).

Regarding claim 36, as similarly discussed above with regard to claim 1, Alavie et al. disclose an optical channel monitor (Figure 9), comprising:

an optical input port (i.e., one of the inputs on the left side of figure 9);

a photodetector (such as photodetector 24) disposed in an optical path communicating at least intermittently with the optical input port (column 6, lines 1-3);

an optical filter (tunable filter 14) disposed in the optical path between the optical input port and the photodetector (column 4, lines 31-35); and

an optical band splitter (wavelength dependent optical splitter 52) disposed in the optical path between the optical filter and the photodetector (column 5, lines 60-64).

Alavie et al. further disclose that the channel monitor is used in a wavelength division multiplexed optical communication system. Although they do not explicitly show the system in figures, they clearly disclose that the wavelength division multiplexed

optical communication system comprises a plurality of transmitters, an optical multiplexer, an optical transmission line, an optical demultiplexer, and a plurality of receivers as recited in the claim (column 1, lines 21-34).

### *Claim Rejections - 35 USC § 103*

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. Claims 8, 10, 16, and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Alavie et al. in view of Stoner et al. (US 6,744,793 B2).

Regarding claims 8, 10, 16, and 17, Alavie et al. disclose a system as discussed above with regard to claims 6 and 15, including an optical reference system comprising a broadband optical source (LED 36 in Figure 9 or LED 62 in Figure 10). They do not specifically disclose a reference gas cell. However, Stoner et al. teach a system related to the one disclosed by Alavie et al. including providing a stable reference light source (Figure 2A). Stoner et al. further teach an optical reference system comprising a broadband optical source 30 and a reference gas cell 34 comprising hydrogen cyanide gas (column 4, lines 66-67; column 5, lines 1-12). Regarding claims 8, 10, 16, and 17, it would have been obvious to a person of ordinary skill in the art to include an optical reference system comprising a broadband optical source and a hydrogen cyanide reference gas cell as taught by Stoner et al. in the system disclosed by Alavie et al. in order to provide a wavelength reliable reference signal.

6. Claims 12, 13, 21, and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Alavie et al. in view of Yun et al. (US 6,816,515 B1).

Regarding claims 12, 13, 21, and 22, Alavie et al. disclose a system as discussed above with regard to claims 11 and 20, including a drive source, but they do not specifically disclose an oscillator generating a triangular electrical signal. However, Yun et al. teach a system related to the one disclosed by Alavie et al. including a scanning Fabry-Perot filter 320 (Figure 3). Yun et al. further teach driving the Fabry-Perot filter with an oscillator generating a triangular electrical signal (column 7, lines 24-43; column 8, lines 26-44). It would have been obvious to a person of ordinary skill in the art to drive the Fabry-Perot filter disclosed by Alavie et al. using an oscillator generating a triangular electrical signal as taught by Yun et al. in order to provide a linearly varying range of wavelengths for scanning the signals in the system as disclosed by Alavie et al.

7. Claims 30 and 33 are rejected under 35 U.S.C. 103(a) as being unpatentable over Alavie et al. in view of Bortz (US 6,771,905 B1).

Regarding claims 30 and 33, Alavie et al. disclose a system as discussed above with regard to claims 24 and 31 respectively above, and further disclose that the multibandpass filter (tunable filter 14) and Bragg gratings 40 are sensitive to temperature (column 5, 7-13). Alavie et al. do not further disclose determining a temperature of the multibandpass filter or monitoring the temperature of the Bragg gratings, but Bortz teaches a system related to the one disclosed by Alavie et al. including filtering optical signals using Fabry-Perot or Bragg filters (column 12, lines 51-59). Bortz further suggests determining or monitoring the temperature of such filters (column 13, lines 55-65). It would have been obvious to a person of ordinary skill in the art to include

determining or monitoring the temperature of the multibandpass filter and Bragg gratings disclosed by Alavie et al. as taught by Bortz in order to ensure that the temperature-sensitive filter elements are still functioning reliably and producing expected outputs under normal temperature conditions.

### *Allowable Subject Matter*

8. Claims 28 and 29 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

9. The following is a statement of reasons for the indication of allowable subject matter:

The prior art, including Alavie et al., Stoner et al., Yun et al., and Bortz, does not specifically disclose or fairly suggest a method including the combination of all the elements, steps, and limitations specifically recited in claims 28 and 29, particularly wherein a second wavelength-to-voltage function is generated using a wavelength transform function consisting of relating the wavelengths in the reference optical signal with the wavelengths in the measurement signal with the following equation: $\lambda_{m-1}$ = (m/m-1)$\lambda$m, where m and m-l represent the order of the wavelength passband, m being an integer number greater than 1, $\lambda$m and $\lambda$m-l are wavelengths transmitted at the m th and m-l th order respectively.

### *Conclusion*

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Christina Y. Leung whose telephone number is 571-272-3023. The examiner can normally be reached on Monday to Friday, 6:30 to 3:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jason Chan can be reached on 571-272-3022. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 571-272-2600.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Christina Y Leung
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